

Requested information:

Platform: NOAA WP-3D

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Instrument name: NO_y/Ozone instrument

Species measured: NO, NO₂, NO_y, and O₃

Measurement method: NO: ozone-induced chemiluminescence (CL)
NO₂: UV photolysis – CL
NO_y: heated Au catalyst – CL
O₃: NO-induced CL

Reported data interval: 1-s averages

Calibration method (if applicable):
routine in-flight standard additions of NO, NO₂, HNO₃, and O₃

Zeroing method (if applicable):
Routine in-flight addition of ozone to pre-reactor volume for NO, NO₂, and NO_y
O₃ channel zeroed by overflowing dry UHP air

Reference(s) for this instrument (if applicable):
NO and NO_y channels: J. Geophys. Res., 104, 5483-5492 (1999)
NO₂ channel: J. Geophys. Res., 105, 26,447-26,461 (2000)
O₃ channel: new instrument; method has been described by Ridley et al., J.
Atmos. Oceanic Technol., 9, 142-148 (1992).

Optional information:

Additional details: brief inlet description, aerosol cutpoint, RH at sampling point, etc.:

2004 will be the first deployment of a new O₃ CL instrument on the NOAA P-3. This measurement is calibrated by in-flight standard additions using the output of a custom-built O₃ generation and absorption device, which has been compared against standard Dasibi and Teco photometers in the laboratory.

The NO₂ channel uses a 100W Hg arc lamp, affording ca. 50% conversion to NO in photocell residence times of 1.0 s.

ICARTT 2004 instrument questionnaire

NO_y channel HNO₃ transmission time constants and efficiencies are determined by in-flight standard addition of known amounts of nitric acid from a thermostated, pressurized permeation tube. Perm tube output is routinely calibrated by optical absorption at 185 nm (Neuman et al., Environ. Sci. Technol., 37, 2975-2981 (2003)).